

Ephemeris for Physical Observations

Greenwich Noon		Angle of Position of M's Axis. P	Latitude of		Annual Parallax. A-L.	L-O.	Longitude of M's Central Meridian. (878°25) (870°27)		Corr. for Phase.
			Earth above M's Equator. B	Sun B			I.	II.	
1887. Dec.	24	13°923	-2°990	-3°060	-6°202	100°800	21°23	86°11	+0°168
	29	13°552	2°999	3°058	6°794	101°779	91°76	116°74	'201
1888. Jan.	3	13°189	-3°007	-3°056	-7°358	102°728	162°34	147°42	+0°236
	8	12°834	3°015	3°054	7°889	103°644	232°98	178°16	'271
	13	12°489	3°023	3°052	8°383	104°525	303°67	208°95	'306
	18	12°157	3°031	3°050	8°837	105°366	14°42	239°79	'340
	23	11°838	3°038	3°048	9°247	106°163	85°23	270°70	'372
	28	11°535	3°046	3°045	9°610	106°913	156°10	301°66	'402
Feb.	2	11°251	-3°054	-3°042	-9°924	107°613	227°03	332°69	+0°429
	7	10°987	3°062	3°040	10°183	108°259	298°03	3°79	'451
	12	10°744	3°070	3°037	10°384	108°848	9°09	34°95	'469
	17	10°525	3°078	3°034	10°523	109°375	80°22	66°17	'482
	22	10°333	3°085	3°030	10°598	109°837	151°42	97°47	'489
	27	10°168	3°093	3°027	10°605	110°231	222°69	128°83	'489
Mar.	3	10°032	-3°101	-3°023	-10°541	110°555	294°02	160°26	+0°483
	8	9°926	3°109	3°020	10°404	110°806	5°43	191°76	'471
	13	9°852	3°117	3°016	10°191	110°982	76°90	223°33	'452
	18	9°810	3°125	3°012	9°901	111°080	148°44	254°97	'427
	23	9°801	3°132	3°008	9°532	111°100	220°05	286°67	'395
	28	9°825	3°139	3°004	9°085	111°042	291°72	318°43	'359
Apr.	2	9°882	-3°146	-2°999	-8°560	110°906	3°44	350°26	+0°319
	7	9°970	3°151	2°995	7°959	110°694	75°22	22°14	'276
	12	10°089	3°156	2°990	7°284	110°409	147°05	54°06	'231
	17	10°237	3°159	2°985	6°539	110°053	218°93	86°03	'180
	22	10°412	3°161	2°980	5°729	109°633	290°84	118°04	'141
	27	10°610	3°161	2°975	4°861	109°156	2°77	150°08	'101
May	2	10°827	-3°160	-2°970	-3°944	108°628	74°72	182°13	+0°061
	7	11°061	3°157	2°965	2°983	108°057	146°68	214°19	'031
	12	11°307	3°152	2°959	1°988	107°453	218°64	246°24	'011
	17	11°561	3°145	2°954	-0°972	106°829	290°58	278°28	+0°00
	22	11°817	3°135	2°948	+0°054	106°193	2°49	310°29	...
	27	12°071	3°123	2°942	1°081	105°557	74°37	342°27	-0°00
June	1	12°320	-3°110	-2°936	+2°098	104°932	146°20	14°20	'011
	6	12°559	3°095	2°930	3°093	104°329	217°97	46°07	-0°04
	11	12°784	3°078	2°924	4°056	103°757	289°67	77°87	'07

of Jupiter, 1888. By A. Marth.

Greenwich Noon.	Diameter		Difference of limbs		Defect of illumination.			<i>d</i>	<i>u</i>
	Equat.	Polar.	in A.R.	in Decl.	Equat. in A.R. in Decl.	preced. limb.	north l.		
1887.									
Dec. 14	31 ^{''} 75	29 ^{''} 74	2 ^s 223	29 ^{''} 86	0 ^{''} 09	0 ^s 006	0 ^{''} 01	6 ^c 19	27 ^c 57
29	32 ^{''} 02	29 ^{''} 99	2 ^s 245	30 ^{''} 10	0 ^{''} 11	0 ^s 007		6 ^c 78	27 ^c 76
1888.									
Jan. 3	32 ^{''} 32	30 ^{''} 26	2 ^s 269	30 ^{''} 37	0 ^{''} 13	0 ^s 009	0 ^{''} 01	7 ^c 35	270 ^c 65
8	32 ^{''} 64	30 ^{''} 56	2 ^s 295	30 ^{''} 67	0 ^{''} 15	0 ^s 010		7 ^c 88	270 ^c 55
13	32 ^{''} 99	30 ^{''} 89	2 ^s 323	30 ^{''} 99	0 ^{''} 18	0 ^s 012		8 ^c 37	270 ^c 45
18	33 ^{''} 37	31 ^{''} 25	2 ^s 353	31 ^{''} 34	0 ^{''} 20	0 ^s 013		8 ^c 82	270 ^c 38
23	33 ^{''} 77	31 ^{''} 63	2 ^s 384	31 ^{''} 72	0 ^{''} 22	0 ^s 015		9 ^c 23	270 ^c 33
28	34 ^{''} 20	32 ^{''} 03	2 ^s 417	32 ^{''} 12	0 ^{''} 24	0 ^s 016		9 ^c 59	270 ^c 27
Feb. 2	34 ^{''} 65	32 ^{''} 46	2 ^s 451	32 ^{''} 55	0 ^{''} 26	0 ^s 018	0 ^{''} 01	9 ^c 91	270 ^c 21
7	35 ^{''} 15	32 ^{''} 91	2 ^s 487	33 ^{''} 00	0 ^{''} 28	0 ^s 019		10 ^c 17	270 ^c 15
12	35 ^{''} 66	33 ^{''} 39	2 ^s 525	33 ^{''} 47	0 ^{''} 29	0 ^s 020		10 ^c 37	270 ^c 10
17	36 ^{''} 19	33 ^{''} 89	2 ^s 564	33 ^{''} 97	0 ^{''} 30	0 ^s 021		10 ^c 51	270 ^c 05
22	36 ^{''} 74	34 ^{''} 41	2 ^s 605	34 ^{''} 48	0 ^{''} 31	0 ^s 022		10 ^c 58	269 ^c 99
27	37 ^{''} 31	34 ^{''} 94	2 ^s 647	35 ^{''} 01	0 ^{''} 32	0 ^s 022		10 ^c 59	269 ^c 92
Mar. 3	37 ^{''} 89	35 ^{''} 49	2 ^s 689	35 ^{''} 56	0 ^{''} 32	0 ^s 022	0 ^{''} 01	10 ^c 52	269 ^c 85
8	38 ^{''} 49	36 ^{''} 05	2 ^s 732	36 ^{''} 12	0 ^{''} 32	0 ^s 022		10 ^c 39	269 ^c 77
13	39 ^{''} 10	36 ^{''} 61	2 ^s 776	36 ^{''} 69	0 ^{''} 31	0 ^s 021		10 ^c 17	269 ^c 69
18	39 ^{''} 71	37 ^{''} 18	2 ^s 819	37 ^{''} 26	0 ^{''} 29	0 ^s 020		9 ^c 88	269 ^c 59
23	40 ^{''} 31	37 ^{''} 75	2 ^s 862	37 ^{''} 83	0 ^{''} 27	0 ^s 019		9 ^c 52	269 ^c 48
28	40 ^{''} 91	38 ^{''} 31	2 ^s 905	38 ^{''} 39	0 ^{''} 25	0 ^s 018		9 ^c 07	269 ^c 35
Apr. 2	41 ^{''} 50	38 ^{''} 86	2 ^s 946	38 ^{''} 94	0 ^{''} 23	0 ^s 016	0 ^{''} 01	8 ^c 55	269 ^c 19
7	42 ^{''} 06	39 ^{''} 39	2 ^s 985	39 ^{''} 47	0 ^{''} 20	0 ^s 014	0 ^{''} 01	7 ^c 95	269 ^c 01
12	42 ^{''} 60	39 ^{''} 89	3 ^s 022	39 ^{''} 98	0 ^{''} 17	0 ^s 012	0 ^{''} 00	7 ^c 27	268 ^c 81
17	43 ^{''} 10	40 ^{''} 36	3 ^s 056	40 ^{''} 45	0 ^{''} 13	0 ^s 010		6 ^c 53	268 ^c 56
22	43 ^{''} 55	40 ^{''} 78	3 ^s 086	40 ^{''} 88	0 ^{''} 11	0 ^s 008		5 ^c 72	268 ^c 23
27	43 ^{''} 95	41 ^{''} 16	3 ^s 112	41 ^{''} 26	0 ^{''} 08	0 ^s 006		4 ^c 86	267 ^c 78
May 2	44 ^{''} 29	41 ^{''} 48	3 ^s 134	41 ^{''} 58	0 ^{''} 05	0 ^s 004		3 ^c 94	267 ^c 16
7	44 ^{''} 57	41 ^{''} 74	3 ^s 152	41 ^{''} 84	0 ^{''} 03	0 ^s 002		2 ^c 98	266 ^c 11
12	44 ^{''} 78	41 ^{''} 94	3 ^s 164	42 ^{''} 05	0 ^{''} 01	0 ^s 001		2 ^c 00	264 ^c 11
17	44 ^{''} 91	42 ^{''} 06	3 ^s 171	42 ^{''} 18	0 ^{''} 00	0 ^s 000		0 ^c 99	258 ^c 22
22	44 ^{''} 97	42 ^{''} 12	3 ^s 172	42 ^{''} 24	on following limb		on south limb	0 ^c 21	164 ^c 9
27	44 ^{''} 95	42 ^{''} 10	3 ^s 168	42 ^{''} 23				1 ^c 10	100 ^c 1
June 1	44 ^{''} 86	42 ^{''} 01	3 ^s 159	42 ^{''} 14	0 ^{''} 01	0 ^s 001		2 ^c 10	95 ^c 0
6	44 ^{''} 69	41 ^{''} 85	3 ^s 144	41 ^{''} 99	0 ^{''} 03	0 ^s 002		3 ^c 09	93 ^c 2
11	44 ^{''} 45	41 ^{''} 63	3 ^s 125	41 ^{''} 77	0 ^{''} 06	0 ^s 004	0 ^{''} 00	4 ^c 05	92 ^c 21

Greenwich Noon	Angle of Position of \mathcal{U} 's Axis. P	Latitude of Earth above \mathcal{U} 's Equator.		Annual Parallax. A-L.	L-O.	Longitude of \mathcal{U} 's Central Meridian.		Corr. for Phase.
		B	B			I. (873°25)	II. (870°27)	
1888.								
June 16	12°991	3°059	2°917	4°977	103°227	1°30	109°60	°108
21	13°178	3°040	2°910	5°850	102°747	72°84	141°25	°149
26	13°342	3°020	2°903	6°666	102°324	144°29	172°80	°194
July 1	13°481	-3°000	-2°896	+7°419	101°963	215°66	204°27	-0°240
6	13°594	2°980	2°889	8°104	101°671	286°93	235°64	°286
11	13°679	2°959	2°882	8°717	101°450	358°11	266°92	°331
16	13°736	2°938	2°875	9°256	101°304	69°19	298°10	°373
21	13°764	2°917	2°868	9°720	101°234	140°17	329°19	°411
26	13°763	2°898	2°860	10°108	101°240	211°06	0°19	°445
31	13°734	2°879	2°852	10°420	101°321	281°87	31°10	°473
Aug. 5	13°676	-2°860	-2°844	+10°658	101°477	352°59	61°92	-0°494
10	13°590	2°842	2°836	10°822	101°708	63°23	92°66	°509
15	13°476	2°825	2°828	10°914	102°011	133°79	123°33	°518
20	13°335	2°809	2°820	10°936	102°383	204°28	153°92	°520
25	13°168	2°794	2°812	10°892	102°821	274°71	184°45	°515
30	12°975	2°780	2°803	10°785	103°323	345°07	214°92	°506
Sept. 4	12°757	-2°776	-2°794	+10°618	103°886	55°38	245°33	-0°491
9	12°515	2°752	2°785	10°393	104°507	125°64	275°69	°470
14	12°249	2°739	2°776	10°113	105°183	195°85	306°00	°445
19	11°959	-2°726	-2°767	+9°782	105°909	266°01	336°27	-0°419

The angle $A-L$ is the difference of the jovicentric longitudes of the Sun and Earth, reckoned in the plane of *Jupiter's* equator; $L-O+180^\circ$ the jovicentric longitude of the Earth reckoned from O, the point of the vernal equinox of *Jupiter's* northern hemisphere or the point of the ascending node of the planet's orbit on its equator.

Two values of the "longitude of \mathcal{U} 's central meridian" are given for each date: the first, computed with the daily rate of rotation $878^\circ 25$, being intended for comparing the observations of the white spots in the neighbourhood of the planet's equator; the second, computed with the rate $870^\circ 27$, for the observations of the remnant of the great reddish spot in the planet's southern hemisphere. These rates, and the deduced longitudes, conform with those adopted in the ephemeris for the last apparition of *Jupiter* (*Monthly Notices*, vol. xlvii. page 40). The few passages of the great spot across the middle of the disc, observed in the course of the last apparition, render it probable that the spot will be found near the adopted zero meridian of the second system of longitudes. But as any observations of the white spots which may have been made during the last season have

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Greenwich Noon.	Diameter		Difference of limbs		Defect of illumination.			<i>d</i>	<i>u</i>
	Equat.	Polar.	in A.R.	in Decl.	Equat. in A.R. in Decl.	following limb.	south l.		
1888.			^s		^s				
June 16	44'15	41'34	3'101	41'49	'08	'006	'01	4'97	91'62
21	43'78	41'00	3'074	41'15	'11	'008	'01	5'84	91'20
26	43'36	40'61	3'043	40'76	'15	'010	'01	6'66	90'88
July 1	42'90	40'17	3'009	40'33	0'18	0'012	0'01	7'41	90'65
6	42'40	39'70	2'973	39'86	'21	'014	'01	8'09	90'46
11	41'87	39'21	2'935	39'36	'24	'016	'01	8'70	90'30
16	41'32	38'69	2'896	38'84	'27	'018	'02	9'24	90'17
21	40'75	38'16	2'856	38'31	'29	'019	'02	9'71	90'05
26	40'17	37'62	2'816	37'77	'31	'021	'02	10'10	89'96
31	39'59	37'07	2'776	37'22	'33	'022	'02	10'41	89'88
Aug. 5	39'01	36'53	2'736	36'67	0'34	0'022	0'02	10'64	89'81
10	38'43	35'99	2'697	36'13	'34	'023	'02	10'81	89'75
15	37'86	35'46	2'659	35'59	'34	'023	'02	10'90	89'70
20	37'31	34'94	2'622	35'07	'34	'023	'02	10'92	89'65
25	36'78	34'44	2'586	34'57	'33	'022	'02	10'88	89'62
30	36'26	33'96	2'552	34'08	'32	'022	'02	10'77	89'59
Sept. 4	35'76	33'49	2'519	33'60	0'31	0'021	0'01	10'60	89'56
9	35'28	33'04	2'488	33'15	'29	'020	'01	10'38	89'54
14	34'83	32'62	2'459	32'72	'27	'018	'01	10'10	89'52
19	34'40	32'22	2'432	32'31	0'25	0'017	0'01	9'77	89'49

not yet come to my knowledge, it is uncertain how far the chief white spot may have moved away from the neighbourhood of the zero meridian of the first system, and due allowance must be made for this uncertainty. The differences of successive values of the longitudes of \mathcal{U} 's central meridian amount, for the intervals of five days, to 12 rotations in addition to the differences directly deduced; so that, for instance, the differences of the values for December 29 and December 24 are $4390^{\circ}53$ and $4350^{\circ}63$. The addition of the "correction for phase" to the longitudes of the central meridian gives the longitudes of the meridian which bisects the illuminated disc. A list of Greenwich times when these latter longitudes are 0° will be found further on.

The diameters of the disc, &c. depend on the same assumed values as in the ephemerides for preceding apparitions. The formulæ employed may be found in vol. xlv. page 508.

The inclinations γ and the ascending nodes Γ of the orbits of the four satellites of *Jupiter* in reference to the plane of the planet's equator are the following, the longitudes of the nodes being reckoned from O, the point of the ascending node of *Jupiter's* orbit on the equator.

		Sat. I.		Sat. II.		Sat. III.		Sat. IV.	
		γ_1	Γ_1	γ_2	Γ_2	γ_3	Γ_3	γ_4	Γ_4
1888									
Jan.	3	0°01'13	285°3	0°49'28	280°81	0°14'01	248°79	0°31'85	331°19
Mar.	3	0°11'12	283°5	49'27	278°90	1°39'1	248°42	31'78	331°27
May	2	0°11'10	281°7	49'27	276°99	1°38'1	248°03	31'71	331°35
July	1	0°10'9	279°7	49'26	275°07	1°37'2	247°62	31'64	331°42
Aug.	30	0°10'8	277°6	49'25	273°15	1°36'4	247°21	31'56	331°46
Oct.	29	0°10'7	275°5	0°49'24	271°23	0°13'56	246°79	0°31'47	331°48

The following is a list of Greenwich mean times, when the zero meridian in the assumed two systems of longitudes will pass the middle of the illuminated disc.

		I.		II.				I.		II.	
		(878°·25)		(870°·27)				(878°·25)		(870°·27)	
		h	m	h	m			h	m	h	m
1887.	Dec. 26	20	17·4	19	7·6	1888.	Jan. 20	20	28·0	14	52·8
	27	15	58·1	14	59·2		21	16	8·7	20	40·0
	28	21	29·2	20	46·5		22	21	39·6	16	31·4
	29	17	9·9	16	38·0		23	17	20·3	22	18·6
	30	22	40·9	22	25·3		24	22	51·2	18	10·1
	31	18	21·6	18	16·8		25	18	31·8	14	1·5
1888.							26	14	12·4	19	48·7
Jan.	1	14	2·3	14	8·4		27	19	43·4	15	40·1
	2	19	33·4	19	55·6		28	15	24·0	21	27·3
	3	15	14·1	15	47·2		29	20	54·9	17	18·7
	4	20	45·1	21	34·4		30	16	35·5	23	5·9
	5	16	25·8	17	25·9		31	22	6·4	18	57·3
	6	21	56·8	23	13·2	Feb.	1	17	47·0	14	48·8
	7	17	37·5	19	4·7		2	13	27·6	20	35·9
	8	23	8·5	14	56·2		3	18	58·5	16	27·3
	9	18	49·2	20	43·5		4	14	39·1	22	14·4
	10	14	29·9	16	35·0		5	20	10·0	18	5·9
	11	20	0·9	22	22·2		6	15	50·6	13	57·3
	12	15	41·5	18	13·7		7	21	21·5	19	44·4
	13	21	12·5	14	5·2		8	17	2·0	15	35·8
	14	16	53·2	19	52·4		9	12	42·6	11	27·2
	15	22	24·2	15	43·9			22	32·9	21	22·9
	16	18	4·8	21	31·1		10	18	13·5	17	14·3
	17	13	45·5	17	22·6		11	13	54·0	13	5·7
	18	19	16·4	23	9·8			23	44·3	23	1·4
	19	14	57·1	19	1·3		12	19	24·9	18	52·8

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	I.		II.			I.		II.	
	(878°25)		(870°27)			(878°25)		(870°27)	
1888.	h	m	h	m	1888.	h	m	h	m
Feb. 13	15	5.4	14	44.2	Mar. 12	12	2.9	7	54.1
14	10	46.0	10	35.6		21	53.2	17	49.7
	20	36.3	20	31.3	13	17	33.6	13	41.0
15	16	16.8	16	22.6	14	13	14.1	19	28.0
16	11	57.4	12	14.0	15	18	44.8	15	19.2
	21	47.7	22	9.7	16	14	25.3	21	6.2
17	17	28.2	18	1.1	17	10	5.7	7	1.8
18	13	8.8	13	52.5		19	55.9	16	57.4
	22	59.0	23	48.1	18	15	36.4	12	48.7
19	18	39.6	19	39.5	19	11	16.8	8	40.0
20	14	20.1	15	30.9		21	7.0	18	35.6
21	10	0.7	11	22.2	20	16	47.5	14	26.9
	19	50.9	21	17.9	21	12	27.9	10	18.1
22	15	31.5	17	9.3		22	18.1	20	13.8
23	11	12.0	13	0.6	22	8	8.4	6	9.4
	21	2.2	22	56.3		17	58.6	16	5.0
24	16	42.8	18	47.6	23	13	39.0	11	56.3
25	12	23.3	14	39.0		23	29.2	21	51.9
26	8	3.8	10	30.3	24	9	19.4	7	47.5
	17	54.1	20	26.0		19	9.7	17	43.2
27	13	34.6	16	17.4	25	14	50.1	13	34.4
28	9	15.1	12	8.7	26	10	30.5	9	25.7
	19	5.4	22	4.4		20	20.7	19	21.3
29	14	45.9	17	55.7	27	16	1.1	15	12.5
Mar. 1	10	26.4	13	47.0	28	11	41.6	11	3.8
	20	16.6	23	42.7		21	31.8	20	59.4
2	15	57.1	19	34.0	29	17	12.2	16	50.6
3	21	27.9	15	25.4	30	12	52.6	12	41.9
4	17	8.4	21	12.3		22	42.8	22	37.5
5	12	48.9	17	3.7	31	8	33.0	8	33.1
6	8	29.4	12	55.0		18	23.2	18	28.7
	18	19.6	22	50.6	Apr. 1	14	3.6	14	20.0
7	14	0.1	8	46.3	2	9	44.0	10	11.2
	23	50.3	18	41.9		19	34.2	20	6.8
8	19	30.8	14	33.2	3	15	14.6	15	58.0
9	15	11.3	20	20.2	4	10	55.0	11	49.3
10	20	42.0	16	11.5		20	45.2	21	44.9
11	16	22.5	21	58.4	5	16	25.6	17	36.1

G

	I.		II.			I.		II.	
	(878°·25)	(878°·25)	(870°·27)	(870°·27)		(878°·25)	(878°·25)	(870°·27)	(870°·27)
1888. Apr. 6	h m	h m	h m	h m	1888. Apr. 29	h m	h m	h m	h m
	12 6·0	13 27·3	21 56·2	23 22·9		10 56·3	7 25·1	20 46·5	17 20·6
7	7 46·4	9 18·5	17 36·6	19 14·1	30	6 36·7	13 11·8	16 26·9	23 7·4
8	13 17·0	15 5·3	8 57·4	10 56·6	May 1	12 7·2	9 3·0	21 57·4	18 58·6
9	18 47·6	20 52·2	14 28·0	16 43·4	2	7 47·6	14 49·7	17 37·7	24 45·3
10	10 8·4	12 34·6	19 58·5	22 30·2	3	13 18·1	10 40·9	13 18·1	10 40·9
11	15 38·9	18 21·4	11 19·3	14 12·6	4	8 58·4	6 32·1	23 8·3	20 36·5
12	6 59·7	10 3·8	16 49·9	19 59·4	5	14 29·0	12 18·8	18 48·6	16 27·7
13	12 30·2	15 50·6	10 9·3	8 10·0	6	10 9·3	8 10·0	14 29·0	12 18·8
14	8 10·6	11 41·8	12 30·2	15 50·6	7	19 59·5	18 5·6	10 9·3	8 10·0
15	18 0·8	21 37·4	8 10·6	11 41·8	8	15 39·8	13 56·8	19 59·5	18 5·6
16	13 41·2	17 28·5	18 0·8	21 37·4	9	11 20·2	9 47·9	15 39·8	13 56·8
17	9 21·5	13 19·7	13 41·2	17 28·5	10	21 10·3	19 43·5	11 20·2	9 47·9
18	19 11·7	23 15·3	9 21·5	13 19·7	11	16 50·7	15 34·7	21 10·3	19 43·5
19	14 52·1	19 6·5	19 11·7	23 15·3	12	12 31·0	11 25·8	16 50·7	15 34·7
20	10 32·4	14 57·7	14 52·1	19 6·5	13	22 21·2	21 21·4	12 31·0	11 25·8
21	20 22·6	24 53·3	10 32·4	14 57·7	14	8 11·4	7 17·0	22 21·2	21 21·4
22	6 12·8	10 48·9	20 22·6	24 53·3	15	18 1·5	17 12·6	8 11·4	7 17·0
23	16 3·0	20 44·5	6 12·8	10 48·9	16	13 41·9	13 3·7	18 1·5	17 12·6
24	11 43·3	6 40·0	16 3·0	20 44·5	17	9 22·2	8 54·9	13 41·9	13 3·7
25	21 33·5	16 35·6	11 43·3	6 40·0	18	19 12·4	18 50·5	9 22·2	8 54·9
26	7 23·7	12 26·8	21 33·5	16 35·6	19	14 52·7	14 41·7	19 12·4	18 50·5
27	17 13·9	22 22·4	7 23·7	12 26·8	20	10 33·1	10 32·8	14 52·7	14 41·7
28	12 54·2	8 18·0	17 13·9	22 22·4	21	20 23·3	20 28·4	10 33·1	10 32·8
	22 44·4	18 13·6	12 54·2	8 18·0		6 13·4	6 24·0	20 23·3	20 28·4
	8 34·6	14 4·8	22 44·4	18 13·6		16 3·6	16 19·6	6 13·4	6 24·0
	18 24·8	24 0·4	8 34·6	14 4·8		11 44·0	12 10·8	16 3·6	16 19·6
	14 5·1	9 55·9	18 24·8	24 0·4		21 34·1	22 6·4	11 44·0	12 10·8
	23 55·3	19 51·5	14 5·1	9 55·9		7 24·3	8 1·9	21 34·1	22 6·4
	9 45·5	5 47·1	23 55·3	19 51·5		17 14·5	17 57·3	7 24·3	8 1·9
	19 35·6	15 42·7	9 45·5	5 47·1		12 54·8	13 47·7	17 14·5	17 57·3
	5 25·8	11 33·9	19 35·6	15 42·7		8 35·2	9 39·9	12 54·8	13 47·7
	15 16·0	21 29·5	5 25·8	11 33·9		18 25·4	19 35·5	8 35·2	9 39·9
			15 16·0	21 29·5		14 5·7	15 26·6	18 25·4	19 35·5
								14 5·7	15 26·6

Nov. 1887.

Physical Observations of Jupiter.

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	I.	II.		I.	II.
	(878°25)	(870°27)		(878°25)	(870°27)
1888.	h m	h m	1888.	h m	h m
May 22	9 46.1	11 17.8	June 12	17 16.3	13 33.8
	19 36.3	21 13.4	13	3 6.5	9 25.0
23	5 26.5	7 9.0		12 56.7	19 20.7
	15 16.6	17 4.6	14	8 37.2	5 16.3
24	10 57.0	12 55.8		18 27.4	15 11.9
	20 47.2	22 51.4	15	4 17.6	11 3.2
25	6 37.4	8 47.0		14 7.8	20 58.8
	16 27.5	18 42.6	16	9 48.3	6 54.5
26	12 7.9	14 33.7		19 38.5	16 50.1
27	7 48.3	10 24.9	17	5 28.7	2 45.7
	17 38.4	20 20.5		15 19.0	12 41.4
28	13 18.8	16 11.7	18	10 59.4	8 32.7
29	8 59.2	12 2.9		20 49.6	18 28.3
	18 49.4	21 58.5	19	6 39.9	4 23.9
30	4 39.6	7 54.1		16 30.1	14 19.6
	14 29.8	17 49.7	20	12 10.6	10 10.9
31	10 0.1	13 40.9	21	7 51.1	6 2.2
June 1	5 50.5	9 32.1		17 41.3	15 57.8
	15 40.7	19 27.7	22	13 21.8	11 49.1
2	11 21.1	5 23.3	23	9 2.3	7 40.4
	21 11.3	15 18.9		18 52.5	17 36.1
3	7 1.5	11 10.2	24	4 42.7	3 31.8
	16 51.7	21 5.8		14 33.0	13 27.4
4	12 32.1	7 1.4	25	10 13.5	9 18.7
	22 22.3	16 57.0	26	5 54.0	5 10.1
5	8 12.5	12 48.2		15 44.2	15 5.7
	18 2.7	22 43.8	27	11 24.7	10 57.0
6	13 43.1	8 39.4	28	7 5.2	6 48.4
7	9 23.5	4 30.7		16 55.5	16 44.0
	19 13.7	14 26.3	29	12 36.0	12 35.4
8	5 3.9	10 17.5	30	8 16.5	8 26.7
	14 54.1	20 13.2		18 6.8	18 22.4
9	10 34.6	6 8.8	July 1	3 57.1	4 18.1
	20 24.8	16 4.4		13 47.3	14 13.7
10	6 15.0	11 55.6	2	9 27.8	10 5.1
	16 5.2	21 51.3	3	5 8.4	5 56.5
11	11 45.6	7 46.9		14 58.6	15 52.1
	21 35.8	17 42.5	4	10 39.2	11 43.5
12	7 26.1	3 38.2	5	6 19.7	7 34.9

		I.		II.				I.		II.	
		(878° 25)		(870° 27)				(878° 25)		(870° 27)	
		h	m	h	m			h	m	h	m
1888.	July	5	16 10.0	17	30.5	1888.	Aug.	11	13 38.6	13	10.6
	6	11 50.5	13 21.9				12	9 19.3	9 2.1		
	7	7 31.1	9 13.3				13	5 0.0	4 53.6		
	8	3 11.7	5 4.7				14	10 31.1	10 41.0		
		13 1.9	15 0.4				15	6 11.8	6 32.5		
	9	8 42.5	10 51.8				16	11 42.9	12 19.9		
	10	4 23.1	6 43.2				17	7 23.6	8 11.4		
		14 13.4	16 38.9				18	12 54.7	13 58.8		
	11	9 53.9	12 30.3				19	8 35.5	9 50.3		
	12	15 24.8	8 21.7				20	4 16.2	5 41.9		
	13	11 5.4	14 8.8				21	9 47.3	11 29.3		
	14	6 46.0	10 0.2				22	5 28.1	7 20.8		
	15	12 16.9	15 47.3				23	10 59.2	13 8.2		
	16	7 57.5	11 38.7				24	6 40.0	8 59.8		
	17	13 28.4	7 30.2				25	12 11.1	4 51.4		
	18	9 9.0	13 17.3				26	7 51.9	10 38.8		
	19	14 39.9	9 8.8				27	13 23.0	6 30.4		
	20	10 20.5	14 55.9				28	9 3.8	12 17.7		
	21	6 1.1	10 47.4				29	4 44.5	8 9.3		
	22	11 32.1	6 38.8				30	10 15.7	4 0.9		
	23	7 12.7	12 26.0				31	5 56.5	9 48.3		
	24	12 43.7	8 17.5			Sept.	1	11 27.6	5 39.9		
	25	8 24.3	14 4.7				2	7 8.4	11 27.4		
	26	13 55.3	9 56.2				3	12 39.6	7 19.0		
	27	9 35.9	5 47.6				4	8 20.4	13 6.4		
	28	5 16.6	11 34.9				5	13 51.5	8 58.0		
	29	10 47.6	7 26.3				6	9 32.3	4 49.6		
	30	6 28.2	13 13.6				7	5 13.1	10 37.1		
	31	11 59.2	9 5.1				8	10 44.3	6 28.7		
Aug.	1	7 39.9	14 52.3				9	6 25.1	12 16.1		
	2	13 10.9	10 43.8				10	11 56.3	8 7.7		
	3	8 51.6	6 35.3				11	7 37.1	13 55.2		
	4	14 22.6	12 22.6				12	13 8.3	9 46.8		
	5	9 3.3	8 14.1				13	8 49.1	5 38.5		
	6	5 44.0	14 1.4				14	4 29.9	11 25.9		
	7	11 15.0	9 52.9				15	10 1.1	7 17.6		
	8	6 55.7	5 44.4				16	5 42.0	13 5.0		
	9	12 26.8	11 31.7				17	11 13.2	8 56.7		
	10	8 7.5	7 23.2				18	6 54.0	4 48.3		